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tion, minute, parallel, sex, tall, wound. All of these and many others are now included.

Third, more care should be taken to make definitions sufficiently general to include the various uses of the word, rather than so special as to refer only to particular uses. Thus, *conjugate* appears as an adjective, but not as a verb; *conjugating tubes* are defined in a special and unusual sense for the Rhodophyceae and not at all for the Conjugatae; for *pistil* is given (after a wholly erroneous definition in reference to spermatophytes) an obsolete sense which is restricted to the genus *Andreaea*, when in the same sense it was formerly applied to the archegonia of all mosses; *retardation* is not mentioned as other than the "influence of light on growth in certain structures;" and a *fat enzyme* is defined merely as an enzyme "converting olein into oleic acid and glycerin."

Fourth, greater accuracy is sadly needed. A few examples will illustrate this: *Galvanotropic*, "curvature, etc.;" *geotropism*, "the force of gravity as shown by curvature;" *geotaxis*, "movement in plants caused by gravity;" *stamen*, "a male sporophyll;" *pistil*, "the female organ of the flower;" *staminate*, "applied to flowers which are wholly male;" *oogenesis*, "the formation of the oosphere, the early stage of the ovule" (but oosphere is correctly defined later in the same paragraph!); *sap-pressure*, "the force exerted on passing upwards through the tissues;" *spermatogenesis*, "the development of the male elements, antherozoids, pollen-grains, and analogous bodies;" and so on.

Fifth (a matter for the publisher), the use of a more flexible paper and looser binding would contribute much to the handiness of the volume.—C. R. B.

MINOR NOTICES.

The dynamics of living matter.³—In the spring of 1902 Professor JACQUES LOEB was invited to deliver a series of lectures at Columbia University. In these lectures, eight in number, he presented the gist of his researches upon the dynamics of living matter. This book, forming the eighth volume of the Columbia University Biological Series, is a somewhat more complete survey of the field of experimental biology, says the author, than was possible in the lectures. In ten "lectures" he discusses the general chemistry and physical constitution of living matter, certain physical manifestations of life, the rôle of electrolytes, effects of radiant energy, heliotropism and other tropisms, fertilization, heredity, and regeneration.

Through the publication of his collected papers in English in the Decennial Publications of the University of Chicago⁴ Professor LOEB's point of view and the general results of his experimentation have become even more generally

³ LOEB, J., *The dynamics of living matter*. Columbia University Biological Series VIII. 8vo. pp. xii+233. *figs.* 64. New York: The Columbia University Press. 1906. \$3.

⁴ LOEB, J., *Studies in general physiology*, 1905.

known than from the originals. The topics named above are naturally those with which the author has chiefly concerned himself, and it cannot be said that the present volume contributes to general physiological literature anything new. The book is rather a new setting of the brilliant work and suggestive ideas of the author, that have previously enriched physiology, and with them is related the results of others in such wise as to round out the presentation. The lectures are readable and instructive, and they are especially commended to the attention of plant physiologists, who are too apt to pass over literature not strictly pertaining to plants.—C. R. B.

The problems of life.—The third part of this book⁵ was issued last winter, and extends the author's fundamental hypothesis to the phenomena of fertilization and heredity. To him, if one admits the premises, the difficulties of these phenomena fade away like morning mists. The work does not cite definite observations, nor show, except in the most general way, how the known facts can be correlated by this theory; but it presents a clearly reasoned, logical series of deductions, which impresses the reader at once as too simple to be true. Moreover, one is naturally shy of a theory, which, beginning with an assumption regarding the molecular structure of protoplasm and the nature of assimilation, makes reproduction a necessary and inevitable consequence of these assumptions, while heredity likewise follows as a matter of course from the phenomena of fecundation. We were inclined to welcome the molecular conceptions of the first part,⁶ as possibly embodying a fruitful theory, but we cannot follow the author as he widens and heightens his construction upon the acute fundamental assumption. Such inverted pyramids of logic can have no stability.—C. R. B.

Pfeffer's Physiology.—The third and last volume of this work was published about the middle of March.⁷ It treats at length of the movements of plants, including the mechanical responses to various stimuli; and briefly of the production of heat, light, and electric tensions, and of the sources and transformations of energy. The translation, or rather the interpretation of the original, is of the same satisfactory character as in earlier volumes. As before, the editor has introduced supplementary and critical matter in footnotes; and in an appendix of eight pages he has supplied some important facts not mentioned in the first two volumes, and a summary of the more recent literature, especially that connected with the present volume. Throughout, his critical

⁵ GIGLIO-TOS, ERMANNO, *Les problèmes de la vie. III^e partie: La fécondation et l'hérédité.* 8vo. pp. viii + 189. Cagliari: The author, at the University. 1905. *fr.* 8.

⁶ Cf. BOT. GAZETTE 31:275. 1901.

⁷ PFEFFER, W., *The physiology of plants, a treatise upon the metabolism and and sources of energy in plants.* Second fully revised edition; translated and edited by ALFRED J. EWART. Volume III. Imp. 8vo. pp. viii + 451. *figs.* 70. Oxford: The Clarendon Press. 1906. 21s.